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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,781	08/08/2006	Daniel R. Swiler	FER-15400.001.001	6294

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EXAMINER	
JOHNSON, SONJI N	
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2887	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/597,781	SWILER ET AL.	
	Examiner	Art Unit	
	SONJI JOHNSON	2887	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 October 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-7,11-16,18-21,24-31,33-36 and 39-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-7,11-16,18-21,24-31,33-36 and 39-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/13/2010 has been entered.

Response to Amendment

2. Receipt is acknowledged of applicant's amendment filed on10/13/2010. Claim(s) 4, 8-10, 17, 22, 23, 32 and 37-38 has been canceled without prejudice. Claim(s) 1, 14, 29, 44 and 45 have been amended. Claim(s) 1-3, 5-7, 11-16, 18-21, 24-31, 33-36 and 39-45 are pending and an action on the merits is as follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1- 3, 5-7, and 11-16, 18-21, 25-31, 33-36, and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lob et al. US Patent No. 5, 304, 789 in view of Swiler US Patent No. 6, 485, 557, cited by applicant.

Re claim 1, Lob discloses a method of forming an infrared detectable mark on a detectable mark on a substrate comprising:

forming the mark (data mark) on the substrate using a laser marking system and a laser marking composition comprising an infrared reflective inorganic pigment (carbon black) wherein the infrared reflective pigment causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the substrate adjacent to the mark such that the mark can be discerned from the substrate at the predetermined wavelength (Column 2, lines, 55-60, Column 3, lines 34-37, Column 4, lines 5-16 Column 5, lines 1-4; Abstract); and

applying a cover coating (dyed black layer) material comprising an inorganic pigment that is different than the infrared reflective inorganic pigment in the laser marking composition over the mark (data markings 14) and over at least a portion of the substrate adjacent to the mark to form a cover coat wherein the cover coat is in the form of a film wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the substrate through the cover coat at the predetermined wavelength (Column 2, lines 52-54, Column 3, lines 3-7 and lines 27-28, Column 3, lines 65-67,

column 4,lines 61-65, Column 6, lines 14-20, Column6 line3-Column 7, line4, Column 7, lines 10-14, and lines 18-19; Fig. 1) ; and detecting the mark (data markings 14) applied to the substrate through the cover coat at the predetermined wavelength using an infrared detecting device (Column 1, lines 14-25, Column 2, lines 55-60, Column 7, lines 8-14) .

Lob fail to disclose that the cover coat in the form of a film is selected from the group consisting of paint film, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic film.

Swiler discloses using inorganic pigments as colorants for various types of substrates and the applying of a partial or full coating of one or more layer on the surfaces of pigments (Column 4, lines 9-24, Column 3, lines 30-35,Column 4,lines 33-35 and lines 55-60).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the black layer film of Lob to comprise of a film selected from the group consisting of paint films, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic films.

As suggested by Swiler inorganic pigments posses favorable colorant properties and that the use of protective or functional coatings on these pigments enhance their properties (Column 2, lines 49-52 and Column 3, lines 31-35).

Re claim 2, Lob and Swiler discloses the method according to claim 1.

Lob fails to disclose wherein the substrate is a surface of a part for installation in a land vehicle or aircraft (Column 1, lines 10-11) .

Swiler discloses a substrate and a coating covering at least a portion of the substrate wherein various types of substrates may be coated with inorganic pigments (Column 7,lines 52-55).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the substrate of Lob to be of a surface of a part for installation in a land vehicle or aircraft.

Doing so would enable the highly reflective inorganic pigments to be detected on parts such that authenticity of the product can be determined..

Re claim 3, Lob and Swiler discloses the method according to claim 1, and

Lob fails to disclose wherein the substrate is a primer coat layer applied to a surface of an article (Column 1, lines 10-11).

Swiler discloses using inorganic pigments to be used as colorants for various types of substrate and the applying of a partial or full coating of one or more layer of an on the surfaces of pigments (Column 4,lines 33-35 and Column 4, lines 15-18).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the substrate of Lob to be of a primer coat layer applied to a surface of an article.

Swiler discloses that various type of substrates may be coated with the pigments and that a coating may be applied when there is an unfavorable reaction between the

surface of the pigment and the medium where it's being used as a protected layer (Column 4, lines 15-18).

Re claim 5, Lob and Swiler discloses the method according to claim 1.

Lob fails to disclose wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_7$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X + 1 and less than or equal to X + 2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$; and

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $Mn_2V_2O_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Lob such that the infrared reflective inorganic pigment is $Mn_2V_2O_7$.

The $Mn_2V_2O_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 6, Lob and Swiler discloses the method according to claim 14.

Lob fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm.

Swiler discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Lob to comprise of inorganic pigment sized from about 0.02 μm to about 15 μm.

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3,lines 29-31).

Re claim 7, Lob and Swiler discloses the method according to claim 14.

Lob fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm.

Swiler discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Lob to comprise of inorganic pigment sized from about 0.1 μm to about 0.5 μm

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3,lines 29-31).

Re claim 11, Lob and Swiler discloses the method according to claim 1, and Lob further disclose wherein the mark is in the form of a machine-readable code (Column 3, lines 12-14).

Re claim 12, Lob and Swiler discloses the method according to claim .

Lob fails to disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

Swiler discloses wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve (Column 6,lines 32-44).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pigment of Lob to comprise of inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color , composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 13, Lob and Swiler discloses the method according to claim 1.

Lob fails to disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

Swiler disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve (Column 6,lines 32-44).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover of Lob to comprise of two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color, composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 14, Lob discloses a method of forming an infrared detectable mark on a substrate comprising:

applying a marking material comprising an infrared reflective inorganic pigment to the substrate to form the mark (Column 3, lines 34-37, Column 5, lines 1-4);

applying a contrast marking material to the substrate to form a contrast mark proximal to the mark (Column 5, lines 11-13, considered a contrast marking material

since it comprises of titanium dioxide and therefore appearing white Fig. 1), wherein the infrared reflective inorganic pigment causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the contrast mark such that the mark can be discerned from the contrast mark at the predetermined wavelength, wherein at least one of the mark and the contrast mark is formed using a laser marking system (Column 2, lines, 55-60, Column 3, lines 34-37, Column 4, lines 5-16 Column 5, lines 1-4; Abstract; Fig. 1) and

applying a cover coating material(dyed black layer) comprising an inorganic pigment that is different than the infrared reflective inorganic pigment in the marking material over the mark and the contrast mark to form a cover coat wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals both the mark and the contrast mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the contrast mark through the cover coat at the predetermined wavelength (Column 2, lines 52-54, Column 3, lines 3-7 and lines 27-28, Column 3, lines 65-67, column 4,lines 61-65, Column 6, lines 14-20, Column6 line3-Column 7, line4, Column 7, lines 10-14, and lines 18-19; Fig. 1).

Lob fail to disclose that the cover coat in the form of a film is selected from the group consisting of paint film, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic film.

Swiler discloses using inorganic pigments as colorants for various types of substrates and the applying of a partial or full coating of one or more layer on the surfaces of pigments (Column 4, lines 9-24, Column 3, lines 30-35,Column 4,lines 33-35 and lines 55-60).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the black layer film of Lob to comprise of a film selected from the group consisting of paint films, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic films.

As suggested by Swiler inorganic pigments posses favorable colorant properties and that the use of protective or functional coatings on these pigments enhance their properties (Column 2, lines 49-52 and Column 3, lines 31-35).

Re claim 15, Lob and Swiler discloses the method according to claim 14 and Lob further discloses wherein the substrate is a surface of an article (Column 2, lines 38-40).

Re claim 16, Lob and Swiler discloses the method according to claim 14 and Lob further discloses wherein the substrate is a primer coat layer applied to a surface of an article (Column 2, lines 49-50).

Re claim 18, Lob and Swiler discloses the method according to claim 14.

Lob fails to disclose wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_7$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X + 1 and less than or equal to X + 2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$; and

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $Mn_2V_2O_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Lob such that the infrared reflective inorganic pigment is $Mn_2V_2O_7$.

The $Mn_2V_2O_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim19, Lob and Swiler discloses the method according to claim 14.

Lob fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm.

Swiler discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Lob to comprise of inorganic pigment sized from about 0.02 μm to about 15 μm.

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3,lines 29-31).

Re claim 20, Lob and Swiler discloses the method according to claim 14.

Lob fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Lob to comprise of inorganic pigment sized from about 0.1 μm to about 0.5 μm

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3,lines 29-31).

Re claim 21, Lob and Swiler discloses the method according to claim 14 and Lob further discloses wherein the substrate is selected from the group consisting of metal, glass, wood, plastic and ceramic (Column 2, line 62).

Re claim 25, Lob and Swiler discloses the method according to claim 14.

Lob fails to disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve .

Swiler disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve (Column 3,lines 53-56 and Column 6,lines 32-44)

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pigment of Lob to comprise of inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color , composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 26, Lob and Swiler discloses the method according to claim 14.

Lob fails to disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve

Swiler disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve (Column 4, lines 1-17 and 59-66, Fig 4).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover of Lob to comprise of two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color, composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 27, Lob and Swiler discloses the method according to claim 14, and Lob further wherein the contrast marking material comprises an infrared reflective organic pigment in the marking material (Column 5, lines 11-13)

Re claim 28, Lob and Swiler discloses the method according to claim 27.

Lob fails to disclose wherein the infrared reflective inorganic pigment in the contract marking material is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_7$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X + 1 and less than or equal to X + 2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$;

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $Mn_2V_2O_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Lob such that the infrared reflective inorganic pigment is $Mn_2V_2O_7$.

The $Mn_2V_2O_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 29, Lob discloses a method of forming an infrared detectable mark on a substrate comprising:

applying a marking material comprising an infrared reflective inorganic pigment to the substrate to form the mark (Column 3, lines 34-37, Column 5, lines 1-4;)

applying a masking material over at least a portion of the mark and optionally over a portion of the substrate, to form a mask to the substrate to form a contrast mark proximal to the mark (Column 5, lines 11-13, the inlay film comprising the titanium dioxide is considered the mask, wherein the mask is defined as a covering Fig. 1), wherein the infrared reflective inorganic pigment causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the contrast mark such that the mark can be discerned from the contrast mark at the predetermined wavelength, wherein at least one of the mark and the contrast mark is formed using a laser marking system (Column 2, lines, 55-60, Column 3, lines 34-37, Column 4, lines 5-16 Column 5, lines 1-4; Abstract; Fig. 1) and

applying a cover coating material(dyed black layer) comprising an inorganic pigment that is different than the infrared reflective inorganic pigment in the marking material over the mark and the contrast mark to form a cover coat wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals both the mark and the contrast mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the contrast mark through the cover coat at the predetermined wavelength (Column 2, lines 52-54, Column 3, lines 3-7 and lines 27-28, Column 3, lines 65-67, column 4,lines 61-65, Column 6, lines 14-20, Column6 line3-Column 7, line4, Column 7, lines 10-14, and lines 18-19; Fig. 1).

Lob fail to disclose that the cover coat in the form of a film is selected from the group consisting of paint film, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic film.

Swiler discloses using inorganic pigments as colorants for various types of substrates and the applying of a partial or full coating of one or more layer on the surfaces of pigments (Column 4, lines 9-24, Column 3, lines 30-35,Column 4,lines 33-35 and lines 55-60).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the black layer film of Lob to comprise of a film selected from the group consisting of paint films, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic films.

As suggested by Swiler inorganic pigments posses favorable colorant properties and that the use of protective or functional coatings on these pigments enhance their properties (Column 2, lines 49-52 and Column 3, lines 31-35).

Re claim 30, Lob and Swiler discloses the method according to claim 29 and Lob further discloses wherein the substrate is a surface of an article (Column 2, lines 38-40).

Re claim 31, Lob and Swiler discloses the method according to claim 29 and Lob further discloses wherein the substrate is a base coat layer applied to a surface of an article (Column 2, lines 49-50).

Re claim 33, Lob and Swiler discloses the method according to claim 32.

Lob fails to disclose wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_7$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X + 1 and less than or equal to X + 2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$; and

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $Mn_2V_2O_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Swiler further discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm (Column 3, lines 24-28).

Swiler further discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm (Column 3, lines 24-28).

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Lob such that the infrared reflective inorganic pigment is $Mn_2V_2O_7$.

The $Mn_2V_2O_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 34, Lob and Swiler discloses the method according to claim 29.

Lob fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm.

Swiler discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Lob to comprise of inorganic pigment sized from about 0.02 μm to about 15 μm.

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3,lines 29-31).

Re claim 35, Lob and Swiler discloses the method according to claim 29.

Lob fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm.

Swiler disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Lob to comprise of inorganic pigment sized from about 0.1 μm to about 0.5 μm

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3,lines 29-31).

Re claim 36, Lob and Swiler discloses the method according to claim 29 and Lob further discloses wherein the substrate is selected from the group consisting of metal, glass, wood, plastic and ceramic (Column 5, lines 44-55).

Re claim 40, Lob and Swiler discloses the method according to claim 29.

Lob fails to disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve .

Swiler disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve (Column 3,lines 53-56 and Column 6,lines 32-44)

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pigment of Lob to comprise

of inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color , composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 41, Lob and Swiler discloses the method according to claim 29.

Lob fails to disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve

Swiler disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve (Column 6, lines 32-44 and Column 3,lines 53-56)

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover of Lob to comprise of two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color, composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 42, Lob and Swiler disclose the method according to claim 29 and Lob further disclose an infrared reflective inorganic pigment that is different than the infrared reflective inorganic pigment in the marking material(Column 5, lines 11-13) .

Re claim 43, Lob and Swiler discloses the method according to claim 42.

Lob fails to disclose wherein the infrared reflective inorganic pigment in the masking material is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_7$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X + 1 and less than or equal to X + 2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$;

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $Mn_2V_2O_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Lob such that the infrared reflective inorganic pigment is $Mn_2V_2O_7$.

The $Mn_2V_2O_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 44, Lob discloses a non-visible authentication mark comprising a laser mark disposed between a substrate and a cover coating layer that covers the laser mark and at least a portion of the substrate surrounding the laser mark, wherein the laser mark comprises an infrared reflective inorganic pigment and the cover coating layer comprises an inorganic pigment that is different than the infrared reflective inorganic pigment in the laser mark wherein the infrared reflective inorganic pigment in the laser mark causes the laser mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 pm to about 40 pm at a sufficiently different level than the substrate covered by the cover coating layer, and wherein the cover coating layer appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the laser mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength that the mark can be discerned from the substrate through the cover coating layer at the predetermined wavelength (Column 2, lines, 52-60, Column 3, lines 3-7, 27-28, 34-37. 65-67; Column 4, lines 5-16, 61-65;

Column 5, lines 1-4, 11-13; Column 6, lines 14-20; Column 6 line 3-Column 7, line 4, Column 7, lines 10-14, and lines 18-19; Fig. 1; Abstract)

Lob fail to disclose that the cover coat in the form of a film is selected from the group consisting of paint film, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic film.

Swiler discloses using inorganic pigments as colorants for various types of substrates and the applying of a partial or full coating of one or more layer on the surfaces of pigments (Column 4, lines 9-24, Column 3, lines 30-35,Column 4,lines 33-35 and lines 55-60).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the black layer film of Lob to comprise of a film selected from the group consisting of paint films, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic films.

As suggested by Swiler inorganic pigments posses favorable colorant properties and that the use of protective or functional coatings on these pigments enhance their properties (Column 2, lines 49-52 and Column 3, lines 31-35).

Re claim 45, Lob discloses an article marked with a non-visible authentication mark comprising a laser mark disposed between a surface of the article and a cover coating layer that covers the laser mark and at least a portion of the substrate surrounding the laser mark, wherein the laser mark comprises an infrared reflective inorganic pigment and the cover coating layer comprises an inorganic pigment that is

different than the infrared reflective inorganic pigment in the laser mark, wherein the infrared reflective inorganic pigment in the laser mark causes the laser mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 pm to about 40 pm at a sufficiently different level than the surface of the article beneath the cover coating adjacent to the laser mark ,and wherein the cover coating layer appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the laser mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength that the laser mark can be discerned from the surface of the article beneath the cover coating adjacent to the marking layer through the cover coating layer at the predetermined wavelength (Column 2, lines, 52-60, Column 3, lines 3-7, 27-28, 34-37. 65-67; Column 4, lines 5-16, 61-65; Column 5, lines 1-4, 11-13; Column 6, lines 14-20; Column 6 line 3-Column 7, line 4, Column 7, lines 10-14, and lines 18-19; Fig. 1; Abstract).

Lob fail to disclose that the cover coat in the form of a film is selected from the group consisting of paint film, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic film.

Swiler discloses using inorganic pigments as colorants for various types of substrates and the applying of a partial or full coating of one or more layer on the surfaces of pigments (Column 4, lines 9-24, Column 3, lines 30-35,Column 4,lines 33-35 and lines 55-60).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the black layer film of Lob to comprise of a film selected from the group consisting of paint films, porcelain enamel coating films, glass enamel coating films, extruded plastic films and laminated plastic films.

As suggested by Swiler inorganic pigments posses favorable colorant properties and that the use of protective or functional coatings on these pigments enhance their properties (Column 2, lines 49-52 and Column 3, lines 31-35).

5. Claims 24 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lob et al. US Patent No. 5, 304 789 in view of Swiler US Patent No. 6, 485, 557, cited by applicant as applied to claim 14 and 29 above and further in view of Daniel et al. US Patent No. 2001/0005570.

Re claim 24, Lob and Swiler disclose the method according to claim 14.

Lob and Swiler fail to disclose wherein the mark is in the form of a bar code.

However, Daniel discloses protected document which comprises an indivisible stack consisting of a printed portion forming an identifier read by reflection in a first wavelength band, and coated with a lacquer (5) that is opaque in the visible spectrum and has a transmission window including said first wavelength band, as well as a transparent reflective layer (4) forming a diffracting optical mark (abstract, Paragraphs 16, 17 and 23).

Given the teachings of Daniel it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data markings of Lob with wherein the mark is in the form of a bar code.

As suggested by Daniel the identifier is, for example, a bar-code or a series of characters, preferably characters that can be interpreted by an optical character-reading (OCR) system, or even a photograph. The identifier makes it possible to implement a number of combinations determined by the type of marking required. The combinations can be determined in such a way as to allow automatic identification by a reader whose general operation is [the same as] that of the bar-code readers or optical character recognition [systems] in the prior art, or an infrared camera in the case of a photograph (Paragraph 38).

Re claim 39, Lob and Swiler disclose the method according to claim 29

Lob and Swiler fail to disclose wherein the mark is in the form of a bar code.

However, Daniel discloses protected document which comprises an indivisible stack consisting of a printed portion forming an identifier read by reflection in a first wavelength band, and coated with a lacquer (5) that is opaque in the visible spectrum and has a transmission window including said first wavelength band, as well as a transparent reflective layer (4) forming a diffracting optical mark (abstract, Paragraphs 16, 17 and 23).

Given the teachings of Daniel it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data markings of Lob with wherein the mark is in the form of a bar code.

As suggested by Daniel the identifier is, for example, a bar-code or a series of characters, preferably characters that can be interpreted by an optical character-reading (OCR) system, or even a photograph. The identifier makes it possible to implement a number of combinations determined by the type of marking required. The combinations can be determined in such a way as to allow automatic identification by a reader whose general operation is [the same as] that of the bar-code readers or optical character recognition [systems] in the prior art, or an infrared camera in the case of a photograph (Paragraph 38).

Response to Arguments

6. Applicant's arguments with respect to claims 1, 14, 29, 44 and 45 have been considered but are moot in view of the new ground(s) of rejection.

7. Applicant amended the claims with new limitations which necessitated new search and consideration.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SONJI JOHNSON whose telephone number is 571-270-5266. The examiner can normally be reached on Monday-Thursday 7:30 AM -6:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve S. Paik can be reached on 571-272-2404. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SONJI JOHNSON/
Examiner, Art Unit 2887

/Seung H Lee/
Primary Examiner, Art Unit 2887